CARNIVOROUS PLANT NEWSLETTER

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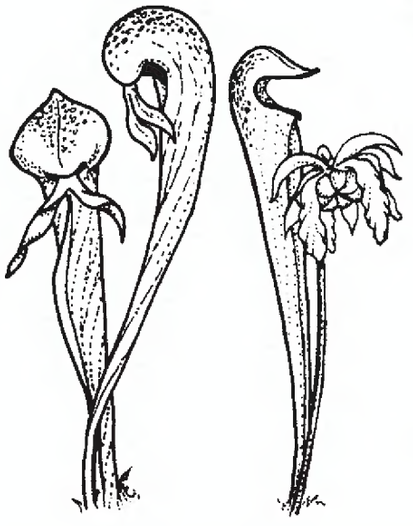

CARNIVOROUS PLANT NEWSLETTER

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Volume 51, Number 3
September 2022

Front Cover: Flower of *Utricularia dunlopii*, Howard Springs, Northern Territory, Australia. Photo by Richard Nunn. Article on page 133.

Back Cover: Flower of *Pinguicula zecheri* 'Faulisi'. Photo by Howard Bramble. Article on page 156.

Carnivorous Plant Newsletter is dedicated to spreading knowledge and news related to carnivorous plants. Reader contributions are essential for this mission to be successful. Do not hesitate to contact the editors with information about your plants, conservation projects, field trips, or noteworthy events. Advertisers should contact the editors. Views expressed in this publication are those of the authors, not the editorial staff.

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International Carnivorous Plant Society, Inc.
2121 N. California Blvd., Suite 290
Walnut Creek, CA 94596-7351, USA
icps@carnivorousplants.org

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CPN Editors	editor@carnivorousplants.org		
Managing Editor	Bob Ziemer	Science Editor	Andreas Fleischmann
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Informational email from the ICPS

John Brittnacher • john@carnivorousplants.org

The ICPS has started sending out informational emails to alert members about time sensitive ICPS functions. The information is posted on our websites and social media, but many members are missing out on the events because finding out about the events does require regular visits to our websites or closely following our social media posts.

Once a month we plan to send out email from ClubExpress with links to our members-only virtual webinars and happy hours on Zoom that are hosted by Kenny Coogan. The Zoom app is required to attend the live events. The webinars are archived to YouTube for viewing later. You can read more about the webinars and happy hours in Kenny's Education Corner on page 148 in this issue.

We are also considering sending out occasional updates related to CPN and special ICPS initiatives. How much we do this depends on member feedback. If you are receiving the email updates but do not want to continue receiving them, please set your ClubExpress account profile privacy option to opt out of general purpose emails. If you are not receiving the emails and want them, you may need to opt in on ClubExpress or it is possible an aggressive spam filter is blocking them.

Erratum: The cultivar description for *Sarracenia* 'Lion's Mane' in CPN 51(2): 118 contained an error. The correct location is Walton County, not Broward County.

A new *Drosera* hybrid: *Drosera ×bockowskii* (Droseraceae)

Bill Scholl • Liberty County • Florida 32321 • USA • scholljunk@gmail.com

Keywords: taxonomy, hybrid, *Drosera ×bockowskii*.
Received: 5 May 2022
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Abstract: *Drosera ×bockowskii* Scholl, a new nothospecies, is the first successful hybridization between *Drosera capillaris* and *Drosera filiformis*.

Introduction

Though the ranges of *Drosera capillaris* and *Drosera filiformis* overlap in both North Carolina and the Florida panhandle a natural hybrid of the two has never been reported. Here I am reporting the first successful artificial hybridization of them (Figs. 1 & 2).

Methods

Naturally occurring plants of *Drosera capillaris* Poiret were collected from my property in Liberty County, Florida and potted up for ease of working with the flowers. *Drosera filiformis* Rafinesque var. *floridana* Rice grown from seed collected in Washington County, Florida sent to me by Jim Bockowski was also used. All plants used were grown in natural sunlight outside. Stamens were removed from the flowers with fine pointed forceps as carefully as possible to try to prevent self-pollination. This seems to stimulate the flowers to close, which coupled with the *D. filiformis* flowers sometimes beginning to close on their own, just as the *D. capillaris* were beginning to open, resulted in several accidental selfings. The removed stamens were rubbed onto the stigmas of the recipient flowers. Between 18 April and 15 May 2019, I attempted 33 crosses with these plants, 17 were *D. capillaris* pollinated by *D. filiformis* and 16 were *D. filiformis* pollinated by *D. capillaris*.

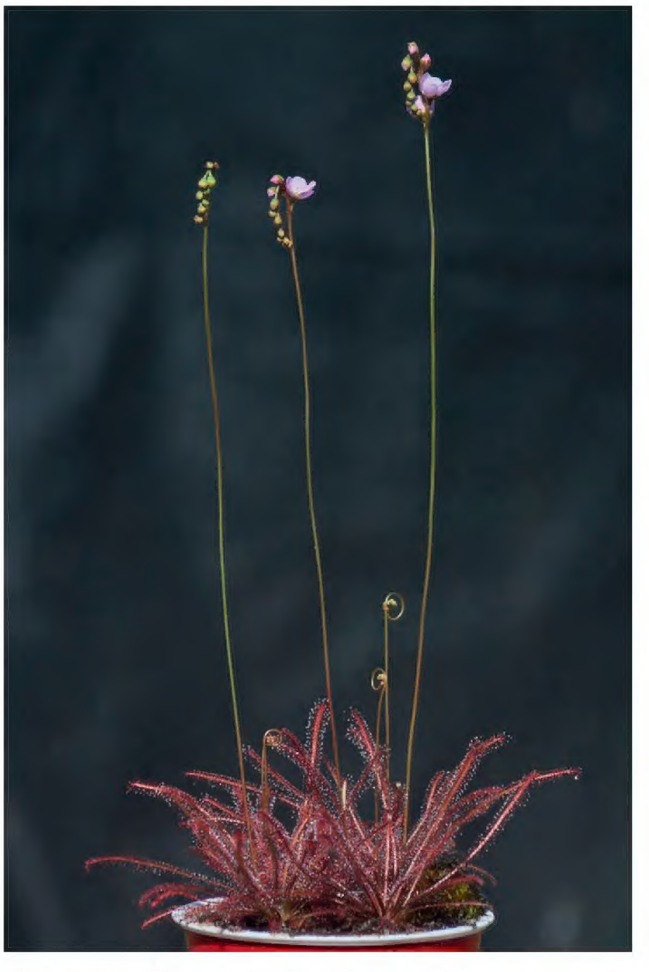

Figure 1: *Drosera ×bockowskii*.

Results

All of the attempts to pollinate *D. capillaris* by *D. filiformis* in 2019 resulted either in *D.*

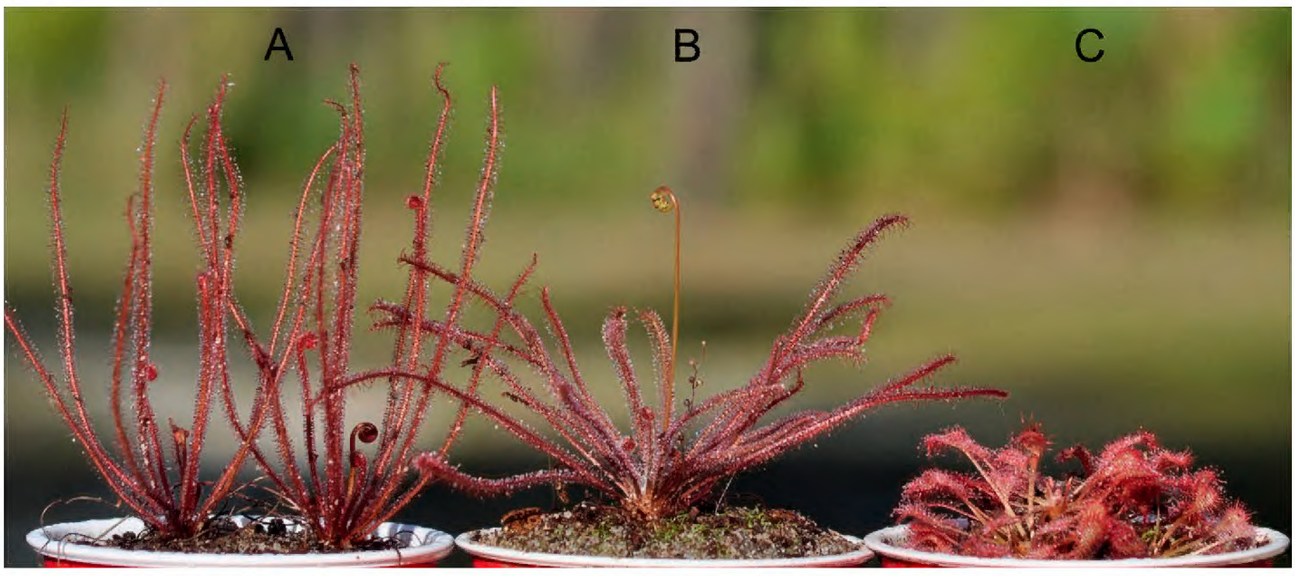

Figure 2: (A) *Drosera filiformis* var. *floridana*, (B) *D.* ×*bockowskii*, and (C) *D. capillaris*.

capillaris seed being produced or no viable seed at all and 18 more attempts made in 2020 and 2021 were also unsuccessful. Both the very first attempted cross of *D. filiformis* × *D. capillaris* on 18 April 2019 and the very last on 15 May 2019 however were successful. The 18 April pollination resulted in 3 germinations, 2 of the plants lived long enough to get leaf cuttings started and are still alive. The 15 May pollination resulted in 11 more clones, all of which lived long enough to get leaf cuttings started so there are now 13 living clones of the F1 hybrid.

In the flowering season of 2020 very few of the F1 flowers actually opened and when they did the anthers often failed to dehisce before the flower closed, resulting in very little or no pollen being available. On six occasions, I was able to get enough pollen to attempt selfing the flowers or cross-pollinating different clones. All of these along with 20 more attempts that I made in 2021 were unsuccessful, indicating that the F1s are probably self-sterile. I have however been able to

Figure 3: Left: Mature plants of (*Drosera capillaris* × *filiformis*) × *D. capillaris* grown from leaf cuttings from one surviving seedling germinated from the seed in Fig. 6B. Right: Three unopened flowers of *Drosera* ×*bockowskii* with protruding stigmas that were pollinated with *D. capillaris* on 12 July 2020 resulting in the first of two successful F2 back-crosses.

successfully pollinate the F1 hybrids with pollen from *D. capillaris* on two occasions to produce back-crossed F2 hybrids (Fig. 3). At least one of these was made by pollinating the stigma tips protruding through the petals of an unopened *D. ×bockowskii* flower (Fig. 3). As of this writing none of the F2 hybrids have bloomed.

I have not attempted back-crossing the F1 hybrids with *D. filiformis* because the two are so similar that their offspring would most likely be difficult to distinguish from *D. filiformis*. I may someday however try the cross using the F1 hybrid as the seed parent to see if it is possible, but at this time, I see no reason to attempt it using *D. filiformis* as the seed parent and have no plans to do so.

***Drosera ×bockowskii* (*Droseraceae*)** Scholl, *nothospec. nov.*

TYPE:

Plants of FLORIDA, artificially hybridized and cultivated at Liberty Co., Fla., U.S.A., 29 April 2021, B.Scholl #1 (NY - holo)

SPECIMENS OF PARENTS:

The pollen parent, *D. capillaris* Poiret, wild collected plants from Liberty Co., Fla. Voucher Scholl #2 (NY).

The seed parent, *D. filiformis* Rafinesque var. *floridana* Rice, from seed collected in Washington Co., Fla. Voucher Scholl #3 (NY).

DIAGNOSIS:

Flowers pink, rosette semi-upright, leaves green to red, tentacles red, forming a winter hibernaculum.

Drosera ×bockowskii differs from *Drosera capillaris* (whose features are given in brackets) by having linear leaves with relatively short petioles (Fig. 4B), the leaves unroll as they open [leaves nearly round to spatulate with relatively long petioles, the lamina unfolds as the leaves open (Fig. 4C]; flowers often not opening fully, petals pink to lavender, styles relatively long placing stigma tips out of reach of anthers preventing self-pollination when the flower closes (Fig. 5B) [flowers open fully, petals nearly white to light pink stigmas touch anthers on closing possibly resulting in self-pollination (Fig. 5C)]; sepals have stalked glands capable of capturing small prey [sepals lack stalked glands]; seeds approximately three times as long as they are wide, warts arranged randomly (Fig. 6B) [seeds approximately two times as long as they are wide, warts usually arranged in longitudinal rows (Fig. 6C)]; forms a winter hibernaculum [remains active year-round does not form a hibernaculum].

Drosera ×bockowskii differs from *Drosera filiformis* (whose features are given in brackets) by having linear leaves with a noticeable petiole expanding slightly from base toward tip ending acutely (Fig. 4B) [leaves filiform without noticeable petiole, gradually narrowing toward tip to a fine point (Fig. 4A)]; stipules deeply divided into multiple narrow lobes (Fig. 4B) [stipules woolly (Fig. 4A)]; flowers often do not open fully, filaments relatively short leaving anthers well below stigmas preventing self-pollination when the flower closes (Fig. 5B) [flowers open fully stigmas touch anthers on closing possibly resulting in self-pollination (Fig. 5A)]; seeds approximately three times as long as they are wide (Fig. 6B) [seeds approximately two times as long as they are wide (Fig. 6A)]; rosette is semi-upright (Fig. 2B) [rosette upright (Fig. 2A)]; form changes with shorter leaves and a flatter rosette between flowering and dormancy [leaf and rosette form remain the same throughout the growing season].

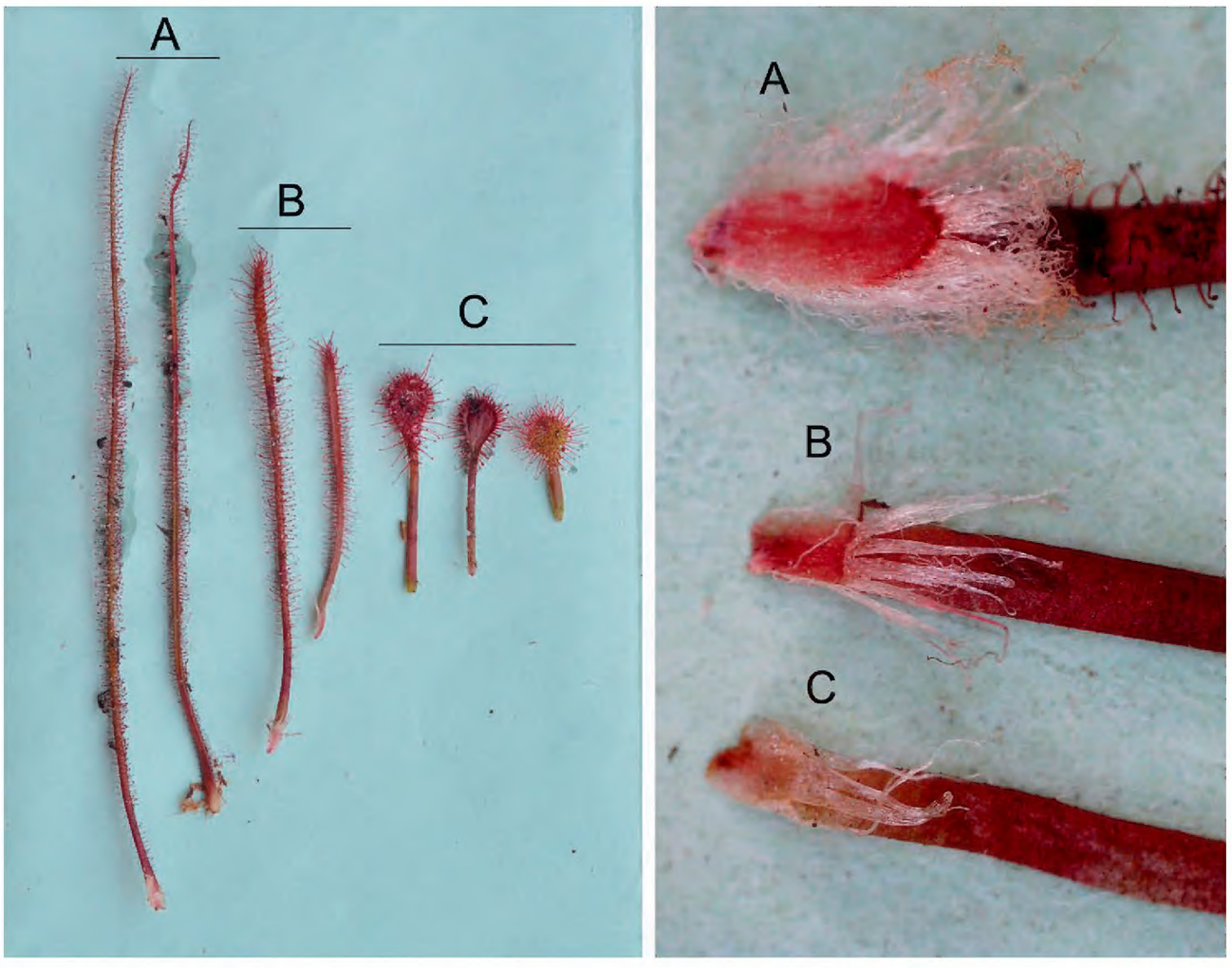

Figure 4: Leaves (left) and stipules (right). (A) *Drosera filiformis* var. *floridana*, (B) *D.* ×*bockowskii*, and (C) *D. capillaris*.

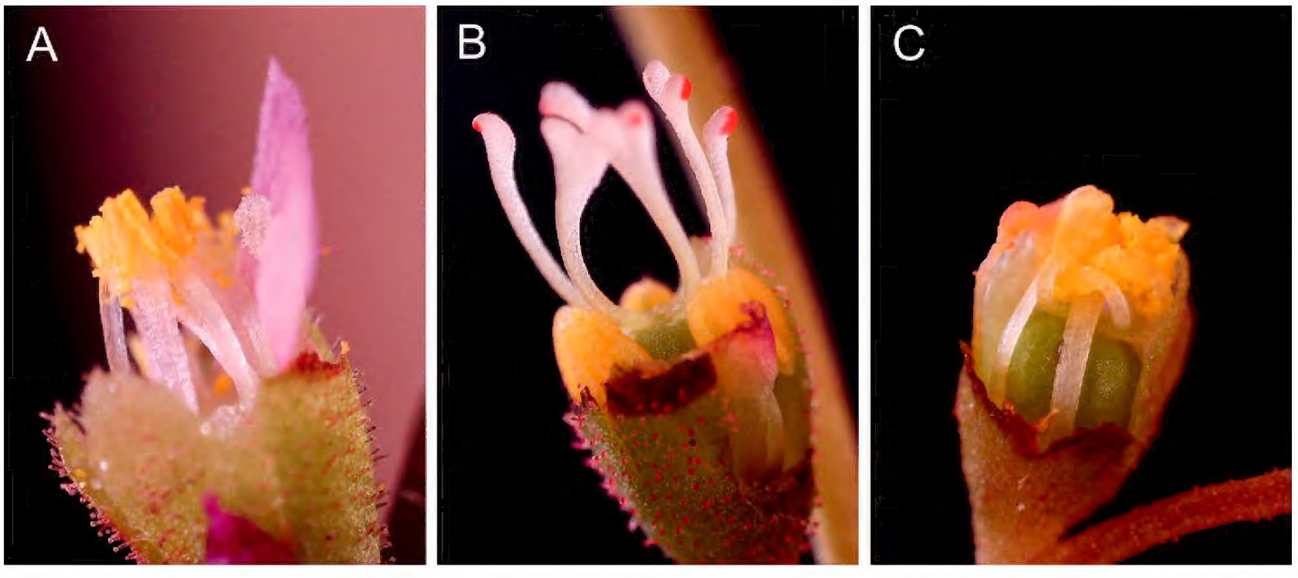

Figure 5: Flowers from which petals were removed soon after closing to show the relation of anthers to stigmas. (A) *Drosera filiformis* var. *floridana*, (B) *D.* ×*bockowskii,* (C) *D. capillaris*.

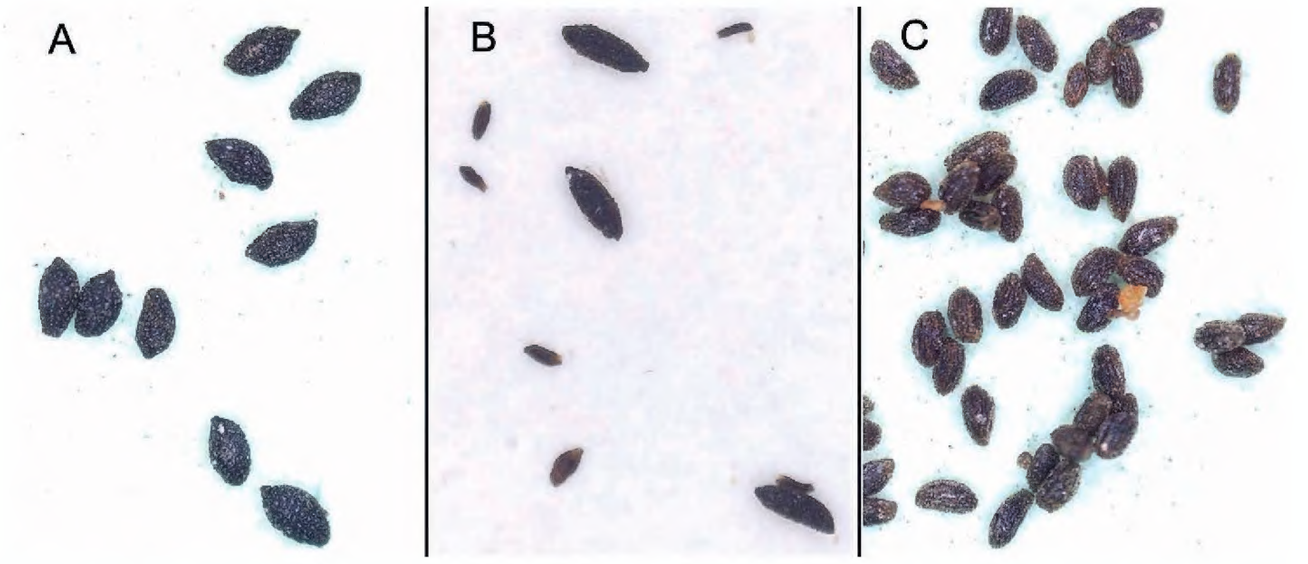

Figure 6: Seeds. (A) *Drosera filiformis* var. *floridana*. (B) *D.* ×*bockowskii* × *D. capillaris*. Three well-formed seeds resulting from the pollination of *D.* ×*bockowskii* flowers shown in Fig. 3 by *D. capillaris*, two of these germinated and one survived. (C) *D. capillaris*.

Flowering season: March through May.

Comparisons were made at early flowering time of at least ten individuals of each of the three plants considered. At this time of year *D.* ×*bockowskii* appears much more similar to its seed parent *D. filiformis* than it does to *D. capillaris*. Between the end of flowering and dormancy it forms shorter leaves and a flatter rosette and appears somewhat more intermediate of its parents. *Drosera capillaris* leaves also shorten and form a flat rosette after flowering but it does not go dormant. Some features such as leaf and petiole length, etc. proved to be too variable to be of value therefore actual dimensions were excluded from the diagnosis in favor of supporting photographs.

ETYMOLOGY:

The epithet, bockowskii honors my dear friend, the late James Michael (Jim) Bockowski, who was planning to attempt this cross at the time of his death.

Acknowledgments: I wish to thank Dr. Stephen Williams and Dr. Susan Verhoek for help with the manuscript and herbarium labels. I also wish to thank Dr. Robert F. C. Naczi of New York Botanical Garden for reviewing and editing the manuscript and herbarium labels, and also for depositing the type and parent vouchers there.

An account of the antennae-flowered *Utricularia* of northern Australia[1]

Richard Nunn • Sydney • Australia • richardjnunn1@gmail.com

Keywords: history, taxonomy, *Utricularia*, Australia, antennae-flowered, species key.
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Abstract: In northern Australia there grows a most remarkable group of 6 species of *Utricularia* with flesh-coloured flowers and an upper or lower corolla lip that has transformed into a pair of tall, erect antennae-like flower lobes. These characters are quite unusual for the genus, and there are numerous hypotheses as to the reasons for these adaptions, the most likely being sexual floral mimicry to attract a pollinator. The aim of this paper is to provide an overview of this highly unusual complex, which includes a botanical history and summarised treatments of each species to provide the reader with the key characters necessary to identify these taxa in the field.

Introduction

The genus *Utricularia* L. (Lentibulariaceae) contains approximately 250 monographed species worldwide (Taylor 1989; Fleischmann 2012, 2015; Lowrie 2014), with 88 of these found in Australia (Nunn 2022). In northern Australia there is a most remarkable group of 6 species, *Utricularia albertiana* R.W.Jobson & Baleeiro, *U. dunlopii* P.Taylor, *U. capilliflora* F.Muell, *U. dunstaniae* F.E.Lloyd, *U. antennifera* P.Taylor and *U. lowriei* R.W.Jobson, that each, with flesh-coloured flowers, have an upper or lower corolla lip that has transformed into a pair of tall, erect antennae-like flower lobes. In *U. lowriei*, *U. antennifera*, *U. albertiana*, and *U. dunstaniae*, these appendages are formed by the lower lip of the corolla, whereas in *U. capilliflora* and *U. dunlopii*, they arise from the upper lip of the corolla (Taylor 1989; Jobson 2013; Lowrie 2013).

These characters are quite unusual for the genus, and there are numerous hypotheses as to the reasons for these adaptions. Taylor (1979) suggests one can only conjecture that the two erect filamentous corolla lobes are connected in some way with pollination by some particular insect. Lowrie (1995, 2001), postulates that flowers of these species much resemble insects (sexual floral mimicry), suggesting that pollination may occur by pseudocopulation. Plachno *et al*. (2016) point out that flowers of sexually deceptive taxa generally possess a set of morphological and physiological characters that mimic their insect pollinators. Reut and Jobson (2010) through molecular studies show that those species having upper corolla appendages have arisen twice independently. The overall floral form in species sharing the filiform appendages, both upper- and lower-lobed, is strikingly similar, with all sharing apricot/flesh-coloured flowers, and the presence of filiform appendages of either type, corresponding strongly with the floral colour. This result provides evidence for Taylor's (1989) hypothesis that mimicry-driven sexual selection may have been a factor during the parallel evolution of filiform corolla lobes.

[1]This article originally appeared in Italian in AIPC Magazine 65: 4–23 (the official publication of Associazione Italiana Piante Carnivore (AIPC)) and was reformatted and modified for CPN (with permission).

Lowrie (1995 and 2001) makes some further interesting field observations, and these are supported by the author who has seen populations of these species in the Northern Territory in 2011, 2012, 2013, 2016, 2018, 2021, Cape York in 2014, and the Kimberley in 2016. Due to the colour and diminutive size of the flowers, they are extremely difficult to see during normal daylight hours and it takes the seasoned observer some time to adjust one's vision to find them. At sunrise and sunset, the angle of the sun is at approximately 15 degrees and the flesh-coloured antenna reflect the sunlight and glow a yellow-bronze colour whilst other low herbaceous plants are dark in colour and don't stand out. Insect activity is at its highest at these times of the day (Lowrie 1995) and further adaptions that position the flowers for maximum illumination, and their scapes somewhat in the background, give the appearance of being airborne, this is enhanced by the slightest gentle breeze making the flowers shimmer back and forward.

Botanical history

The botanical history of the antennae-flowered *Utricularia* dates back to the late 19th century and spans the 20th and early 21st centuries and includes some of the great botanical names of the past, Mueller, Lloyd, and Taylor.

Baron Ferdinand von Mueller published the first of the antennae-flowered *Utricularia*, *U. capilliflora* in 1891 (Mueller 1891). Mueller was appointed Government Botanist for Victoria by Governor Charles La Trobe in 1853 and in the same year, Mueller established the National Herbarium of Victoria (MEL). From 1857 to 1873, he was director of the Royal Botanic Gardens, Melbourne. He described many new plant species sent by botanists from other parts of Australia, notably from Maurice William Holtze in the Northern Territory. Holtze was the director of the Botanic Garden at Port Darwin and with the assistance of his son, Nicholas, collected many new and undescribed species from the Darwin and Arnhem Land area. One such collection by Nicholas Holtze from the Adelaide River, was described by Mueller as a new species, *U. capilliflora*. In his description, Mueller noted that this was one of the most delicate of all vascular plants and the two long hairlet like segments of the upper corolla were quite exceptional in the genus.

In order to extend his knowledge of Australian *Utricularia* species, Francis Ernest Lloyd examined all accessible specimens and in doing so he was able to describe four new species (Lloyd 1936), one of which being *Utricularia dunstaniae*. Baron Ferdinand von Mueller's collection at the National Herbarium, Melbourne, which contained the type specimen of *U. capilliflora*, also contained another specimen that von Mueller had labelled *U. capilliflora*, which turned out to be quite distinct. Collected by N. Holtze (*Holtze 1340*) along the Adelaide River, Northern Territory in 1891, this specimen had similar morphological characters to *U. capilliflora*. However, on close examination by Lloyd was found to have the two antenna-shaped lateral lobes arising from the lower corolla lip and the lower corolla lip was triangular shaped, in *U. capilliflora* these lobes arise from the upper lip. With these distinct differences Lloyd was able to describe this specimen as a new species, *U. dunstaniae*.

Peter Taylor, Kew Botanist, world authority on *Utricularia* and author of the most comprehensive monograph on the genus, made two trips to Australia (Taylor 1989), for 6 weeks in 1979 where he visited all the mainland states, and he returned in May 1980 to spend two weeks in the Northern Territory. These visits to Australia yielded two new species of antennae-flowered *Utricularia*. Whilst in the Northern Territory, Taylor was assisted by Clyde Dunlop, Curator of the Northern Territory Herbarium, to see most of the *Utricularia* native to that region. Taylor was also able to view Dunlop's collections and from *Dunlop 4737*, a collection from Little Nourlangie Rock, described

and later published (Taylor 1986) a new species of antennae-flowered *Utricularia*. This species he named *Utricularia dunlopii*, in honour of Clyde Dunlop. Clyde Dunlop also made extensive collections of plants in the Kimberley region of northern Western Australia, and another of his collections, *Dunlop 5320* from the Mitchell Plains was described and published by Taylor (1986) as *Utricularia antennifera*.

Allen Lowrie (1995) first mentioned a putative new species of antennae-flowered *Utricularia* as *Utricularia* species "Cape York" which he described from a single inflorescence collected by Ann G. Gunness, at Namaleta Creek, c. 90 km N of Weipa, (*AG 2306*, 11 Apr 1994; specimen held in Herbarium Lowrieanum, Perth). Although specimen *AG-2306* was poorly preserved, an interpretation of the inflorescence by Allen Lowrie suggested that this was a new species and would extend the range of antenna flowered *Utricularia* by approximately 1000 km from their Northern Territory locations. Lowrie's suspicions of a new taxa and range extensions were confirmed by Richard Jobson who formally described this new species and named it in honour of Lowrie in 2013. He discovered it north of Cooktown whilst working on the rediscovery of *U. albiflora*. A further range extension was discovered in 2014, when on an ICPS field trip to the northern most point of Australia, Greg Bourke and Charles Clarke, found this taxon growing at Jacky Jacky and Sanamere.

The most recently described member of this complex is *Utricularia albertiana* (Jobson & Baleeiro 2018). In his monograph, Peter Taylor (1989) recognised the Kimberley form of *U. dunstaniae* (*Beauglehole 58874*) as conspecific with the type specimen from near Darwin, NT. In his description of the species, the corolla spur is described as narrowly scrotiform with apex bilobed, the lobes obtuse [= *U. albertiana*] or subacute [= *U. dunstaniae*]. Hence *U. albertiana* was previously thought to be a Kimberley form of the Northern Territory species *U. dunstaniae*. However, a recent molecular phylogenetic study (Jobson 2013; Jobson *et al*. 2018) that included specimens from two of the three known populations of *U. albertiana* and three of *U. dunstaniae* from the Darwin region, placed *U. albertiana* as strongly supported sister species to *U. antennifera*, while *U. dunstaniae* was placed sister to the Cape York endemic *U. lowriei*.

Figure 1: *Utricularia albertiana*, Theda Station, Kimberley, Western Australia. Photo R. Nunn.

Taxonomy

The following are summarised treatments of each species to provide the reader with the key characters necessary to identify these taxa in the field. The author has drawn on the detailed descriptions of Lowrie (2014), Jobson (2013), and Jobson and Baleeiro (2018) as well as his own field observations.

Utricularia albertiana R.W.Jobson & Baleeiro 2018 (Fig. 1)

Description: Small annual, affixed subaquatic herb. *Rhizoids* numerous. *Stolons* few. *Leaves* few, petiolate; lamina obovate or narrowly obovate, apex rounded. *Traps* few at base of peduncle, one or two at nodes of stolon, and singly on internodes, ovoid. *Inflorescence* erect, solitary 60–120 mm long; *Bracts* and *bracteoles* similar, basifixed, sparsely glandular, ovate with apex subacute, slightly gibbous at base. *Flowers* 1, 4–5 mm long (excluding erect appendages); *Corolla* reddish-brown to apricot; upper lip erect, obovate, strongly convex; lower lip 5-lobed with lateral pair filiform, erect, 40–50 mm long, of the three central lobes, two outer lobes absent, central lobe descending, subulate, 2–5 mm long, usually two or three times the length of the spur; palate glabrous, with raised rim; spur inflated, broadly scrotiform, mostly glabrous.

Etymology: The specific epithet honours Prof. Victor A. Albert, botanist and evolutionary biologist in the Department of Biological Sciences at the University at Buffalo, State University of New York.

Phenology: Flowering between February and April. Lowrie records this species also flowering in July to August in the dry season.

Distribution and ecology: Known from three locations in the Northern Kimberley region, Western Australia. The type location is at King Edward River, while a second collection site is c. 50 km to the west (*Dunlop 5320*), also Theda Station.

Grows in shallow pools on sandstone pavement and outcrops.

Notes: *Utricularia albertiana* was previously confused with *U. dunstaniae* from the Northern Territory and differs in having spur apex rounded/obtuse, central corolla lower lip lobe longer than the spur, calyx lower lip almost as long as the spur, and trap dorsal appendage usually present.

Utricularia antennifera P.Taylor 1986 (Fig. 2)

Description: Small annual herb, occasionally perennial, terrestrial or affixed aquatic. *Rhizoids* numerous, *Stolons* few. *Leaves* usually 1 to 4 arising from peduncle bases and from each stolon node; lamina narrowly obovate, apex rounded, petiolate. *Traps* white-translucent, ovoid. *Inflorescence* erect, arising at random along stolons, 6–12 cm long. *Bracts* and *bracteoles* similar, basifixed, ovate, apex rounded. *Flowers* solitary 3–3.5 mm long (excluding 2 very long semi-erect appendages). *Corolla* main body fleshy looking; lower lip adaxial surface pale yellow, abaxial surface similar, 5-lobed, 2 upper appendages antennae-like, bearing a prominent tooth-like appendage at their base, that together surround, but remain well gapped and not touching each other at upper part of open throat (leading to stigma and anthers), very long semi-erect appendages 2.5–5.5 cm long, upper lip pale yel-

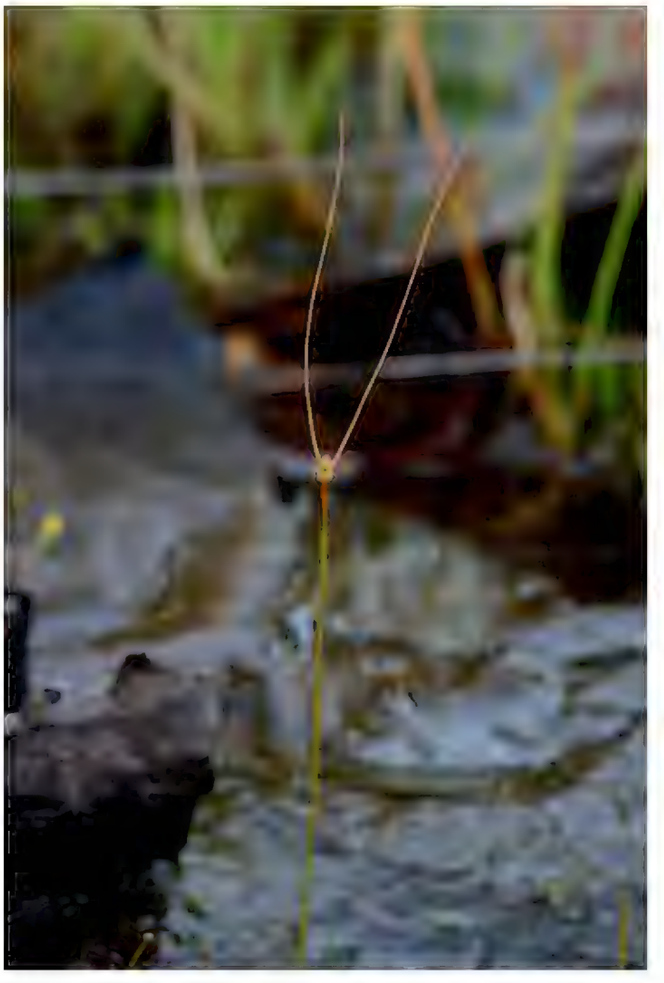

Figure 2: *Utricularia antennifera*, Theda Station, Kimberley, Western Australia. Photo R. Nunn.

low, oblong, apex rounded or emarginate. *Palate* similar colour to corolla, lower part of throat bearing a crenate raised rim, papillose. *Spur* positioned at 80 degrees to lower corolla lip lobes, similar colour to corolla, from base conical, constricted near middle, then soon dilated into an inflated transversely ellipsoidal figure with apex rounded, slightly curved forwards.

Etymology: The epithet *antennifera* is Latin for "antennae-bearing" in reference to its long lateral, semi-erect, antennae-like appendages towering above the main body of the flower.

Phenology: Collected in flower in February and March.

Distribution and ecology: Kimberley region: Mitchell Plateau; near Theda Station Homestead; Beverley Springs Station.

Grows in shallow depressions in wet, black, silty sand skeletal soils over sheet sandstone on the margins of creeks and wet sand on the edges of large, wet season depressions. In gravel or sand over basalt and sandstone in shallow water at low altitude.

Utricularia capilliflora F.Muell. 1891 (Fig. 3)

Description: Small annual to perennial herb, an affixed aquatic. *Rhizoids* numerous, *Stolons* few. *Leaves* usually 1 to 2 arising from peduncle bases and from each stolon node, narrowly obovate, apex rounded, petiolate. *Traps* white-translucent, ovoid. *Inflorescence* erect, arising at random along stolons, 5–8 cm long. *Bracts* and *bracteoles* similar, basifixed, ovate, apex rounded, bases gibbous. *Flowers* solitary, rarely up to 3 on a scape 4.5–4.6 mm long, (excluding 2 very long semi-erect appendages); *Corolla* main body fleshy looking, pale yellow; lower lip adaxial surface pale yellow, abaxial surface similar, 5 lobed, equally extended over an angle of 140 degrees, subulate, upper lateral pair set 20 degrees below horizontal, each bearing a prominent tooth-like appendage at their base that together are nearly surrounding, but are well gapped and not touching each other at upper part of open throat (leading to stigma and anthers), next lateral pair set 45 degrees at either side of central line, lower lobe shorter and set on central line; upper lip pale yellow, triangular at base, forming basal portions of 2 upper antennae-like appendages, crossed over each other near their base, 1.5–2.5 cm long. *Palate* similar colour to corolla, lower part of throat bearing a raised rim. *Spur* positioned at 60 degrees to lower corolla lip lobes, similar in colour to corolla, from base conical, constricted near middle, then soon dilated into an inflated scrotiform figure.

Etymology: The epithet, *capilliflora*, is from the Latin *capillus* (hair-like) and *floris* (flower), in reference to its long, lateral, semi-erect, antennae-like appendages, which arise from the upper lip of the corolla and tower above the main body of the flower, as well as its 5, hair-like, lower lip appendages.

Phenology: Flowers March to May.

Distribution and ecology: Northern Territory. Common in the Darwin region: Howard Springs; Girraween; Noonamah; Freds

Figure 3: *Utricularia capilliflora* Howard Springs, Northern Territory. Photo R. Nunn.

Pass; Humpty Doo; and scattered locations eastwards along the Arnhem Highway to Jabiru, at the foot of the Arnhem Land escarpment.

Grows in damp sand at the edge of creeks and on sand plains in open vegetation at low altitude.

Utricularia dunlopii P.Taylor 1986 (Figs. 4, 7, and front cover)

Description: Small annual to perennial herb, terrestrial, an affixed aquatic when not flowering. *Rhizoids* numerous, *Stolons* few. *Leaves* usually 1 to 6 arising from peduncle bases and from each stolon node; lamina narrowly obovate-apex rounded, petiolate. Traps white-translucent, ovoid. *Inflorescence* erect, arising at random along stolons, 8–10 cm long. *Bracts* and *bracteoles*, similar, basisolute, upper parts ovate, apex acute. *Flowers* solitary 2.5–3 mm long, (excluding 2 very long semi-erect appendages), and commonly branched to support 2–3 flowers; *Corolla* main body fleshy looking, pale pinkish bronze, lower lip adaxial surface pale pinkish bronze, abaxial surface similar, 3-lobed, equally extended over an angle of 100 degrees, subulate, upper lateral pair set below horizontal at 30 degrees, each flared at their base and together forming part of palate on lower part of open throat (leading to stigma and anthers), lower lobe much shorter and set to one side of central line; upper lip pale pinkish bronze, forming basal portions of 2 upper antennae-like appendages, 1.5–2 cm long. *Palate* similar colour to corolla, lower part of throat bearing a raised rim. *Spur* positioned parallel to lower corolla lip lateral lobes, similar in colour to corolla, from base conical, constricted near middle, then soon dilated into an inflated compressed ovoid figure, slightly curved forwards.

Figure 4: *Utricularia dunlopii,* Howard Springs, Northern Territory. Photo R. Nunn.

Etymology: *Utricularia dunlopii*, named in honour of Clyde Dunlop who, by his numerous and careful collections of northern Australian *Utricularia*, has contributed enormously to our knowledge of these plants and who also, by his generous assistance and carefully planned programme, enabled Peter Taylor to see most of the Northern Territory species in the brief space of two weeks in May 1980.

Phenology: Flowers February to May.

Distribution and ecology: Western Australia and Northern Territory. In Western Australia known from a few collections from the Mitchell and King Edward River region and in Northern Territory near Darwin and several locations from the Arnhem Land Plateau.

In the eastern and western limits of its range, grows in damp depressions in sandstone pavement but near Darwin in damp sandy ground in swamps in open vegetation.

Notes: *Utricularia dunlopii* is easily distinguished from its five relatives by its scapes, which are the only in the complex that are commonly multi-flowered

Utricularia dunstaniae F.E.Lloyd 1936 (Fig. 5)

Figure 5: *Utricularia dunstaniae*, Howard Springs, Northern Territory. Photo G. Bourke.

Description: Small annual to perennial herb, terrestrial or affixed aquatic. *Rhizoids* numerous, *Stolons* few. *Leaves* usually 1 to 2 arising from peduncle bases and from each stolon node; lamina narrowly obovate-apex rounded. Traps white-translucent, broadly ovoid. *Inflorescence* erect, arising at random along stolons, 6–12 cm long. *Bracts* and *bracteoles* similar, basifixed, ovate, apex rounded. *Flowers* solitary 4.6–5 mm long, (excluding 2 very long semi-erect appendages); *Corolla* main body fleshy; lower lip adaxial surface pale yellow, abaxial surface similar, 3–5-lobed, 2 upper appendages flesh pink, antennae-like, bearing a prominent tooth-like appendage at their base well-spaced and not touching each other and positioned either side of upper part of open throat (leading to stigma and anthers), very long semi-erect appendages, 1.5–4 cm, gradually tapering towards apex, of remaining 3 lobes, 2 lateral lobes are often absent or very short and variable, central lower lobe is always present, narrowly triangular; upper lip pale yellow, circular, apex mostly rounded sometimes emarginate, positioned above upper calyx lobe. *Palate* similar colour to corolla lower lip, lower part of throat bearing a prominent raised rim, papillose. *Spur* positioned at 40 degrees to lower corolla throat rim, beige and flesh pink in colour, from base conical, constricted near middle, then soon dilated into an inflated scrotiform figure.

Etymology: The epithet, *dunstaniae*, honours Marjorie Lillian Stewart Dunstan (née Carnell) wife of William Dunstan (1895–1957), army officer and Victoria Cross recipient, manager of the Herald in Melbourne, Victoria. Lloyd said of Mrs. Dunstan "….whose sympathetic attitude has done much to foster the love and appreciation of natural history."

Phenology: Collected in flower in March to May

Distribution and ecology: Northern Territory: near Darwin - Howard Springs and McMinns area; Stuart Highway ca. 38.4 km S of Darwin; also, a solitary record from near Jabiru at the foot of the Arnhem Land Escarpment.

Grows in wet sand, often in shallow water, in open vegetation and in sandy, skeletal soils over sheet sandstone on the margins of rivulets, creeks and rivers.

Notes: Of all the antennae-flowered *Utricularia,* this species is the most difficult to locate in the field and has proven elusive on 6 attempts by the author to locate and photograph.

Utricularia lowriei R.W.Jobson 2013 (Fig. 6)

Description: Small probably annual, terrestrial or affixed subaquatic herb. *Rhizoids* numerous, *Stolons* few. *Leaves* few, two or three from base of peduncle and 1 from stolon internodes, peti-

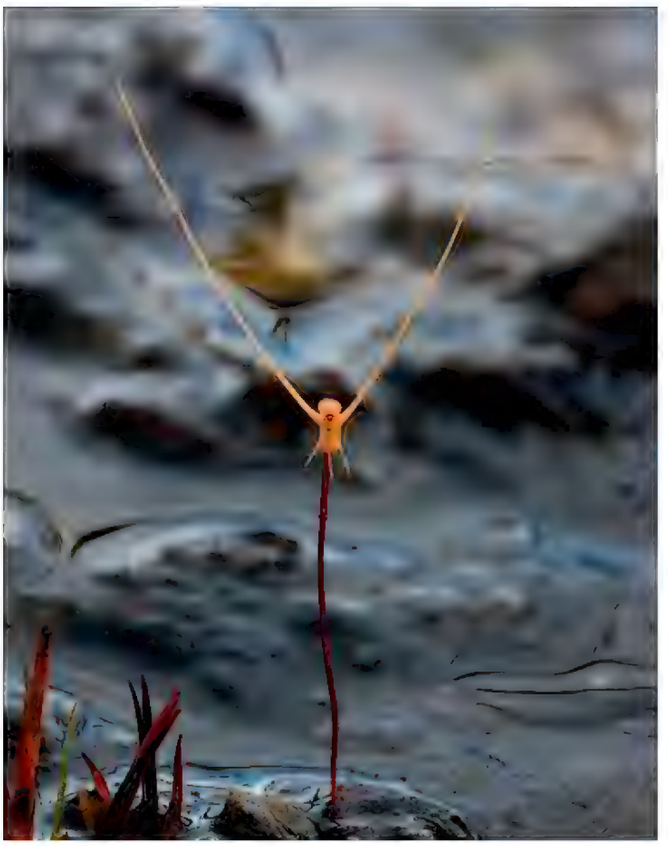

Figure 6: *Utricularia lowriei,* Sanamere Lagoon, Queensland. Photo R. Nunn.

olate; lamina narrowly obovate. *Traps* several at base of peduncle and one at nodes of stolon, ovoid. *Inflorescence* erect, solitary 40–70 mm long; *Bracts* and *bracteoles* similar, basifixed, ovate with rounded apex. Flowers 1, 2–5 mm long (excluding erect appendages). *Corolla* reddish-brown to apricot; lower lip 5–lobed with lateral pair filiform, erect 9–15 mm long, three central lobes descending, subulate/filiform, mostly equal length, usually twice the length of the spur; *Spur* scrotiform, glabrous, from a cylindrical base, longer than the calyx lobe, apex bilobed with each lobe more or less rounded.

Etymology: The specific epithet honours the late botanist and naturalist Allen Lowrie (1948-2021), who has greatly advanced the study of *Drosera*, *Stylidium*, and *Utricularia*.

Phenology: Flowers recorded in July.

Distribution and Ecology: Type location north of Cooktown and the northern most point of Cape York, Sanamere and Jacky Jacky.

Found growing in shallow water at edge of depression on deep sand.

Figure 7: *Utricularia dunlopii* growing in its typical sandstone seepage habitat on the Arnhem Plateau, Northern Territory. Photo Thilo Krueger

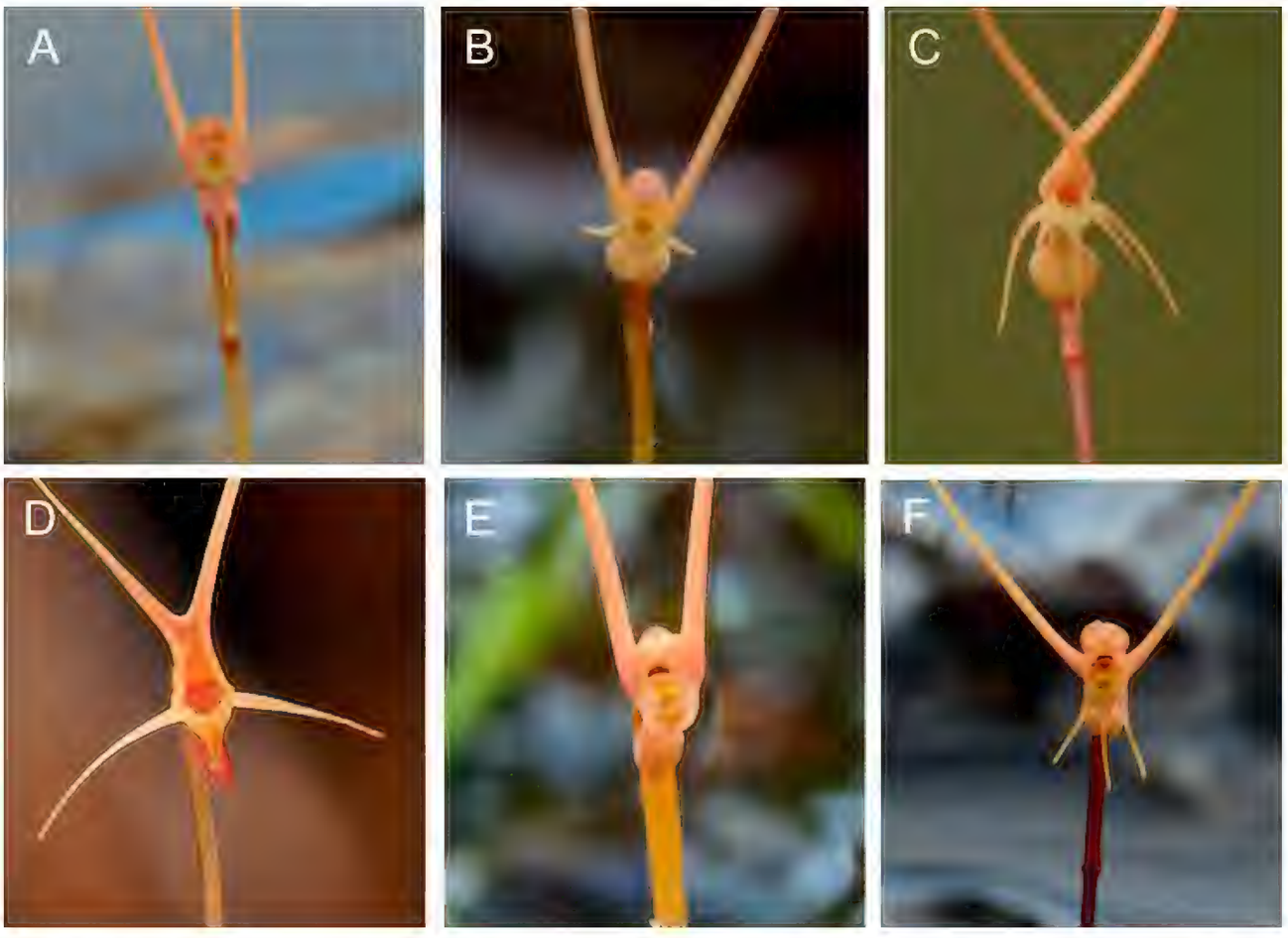

Figure 8: Detail of flowers (A) *Utricularia albertiana*, (B) *U. antennifera*, (C) *U. capilliflora*, (D) *U. dunlopii*, (E) *U. dunstaniae*, (F) *U. lowriei*. Photos (A)-(D), (F) R. Nunn, (E) G. Bourke.

Key to the Australian antennae-flowered *Utricularia* species (modified from Taylor 1989 and Jobson 2013).

1a. Corolla with 2 capillary lobes arising from the corolla upper 2
1b. Corolla with 2 capillary lobes arising from the corolla lower lip 3
2a. Corolla lower lip 5-lobed (Fig. 8C) ..... *U. capilliflora*
2b. Corolla lower lip 3-lobed (Fig. 8D) ..... *U. dunlopii*
3a. Three central lower lip lobes, central lobe longer than the spur 4
3b. Three central lower lip lobes reduced or deltoid, shorter than the spur 5
4a. Two outer central lower lip lobes filiform, longer than the spur (Fig. 8F) ..... *U. lowriei*
4b. Two outer central lower lip lobes absent (Fig. 8A) ..... *U. albertiana*
5a. Dorsal bladder-trap appendage always absent (Fig. 8E) ..... *U. dunstaniae*
5b. Dorsal bladder-trap appendage long and filiform (Fig. 8B) ..... *U. antennifera*

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Grow *Genlisea* so you can see the traps

John Brittnacher • Ashland • Oregon • USA • john@carnivorousplants.org

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Abstract: *Genlisea* species have underground traps. There is a method of growing *Genlisea* that not only allows one to easily see the traps, but also it may be an easier way to grow *Genlisea* in general.

Genlisea species are some of the easiest carnivorous plants to grow but they are not commonly grown because under typical growing conditions all you see above the soil are the small rudimentary leaves and occasional small but cute flowers. It is quite easy to get bored with them. CPN has already had excellent articles on how to grow *Genlisea* (Meyers-Rice 1994; Corino 2020). Plus, there have been photos like Figure 1 in CPN. How to get a photo like that was left to the reader. It turns out it is very easy to grow the plants so you can see the traps any time you want.

There are about 28 species of *Genlisea* (Schlauer 2020). They are found in water saturated soils in Central and South America and Africa. The plants are small, rootless, have underground non-photosynthetic leaves in the form of traps that can be 20 cm long, above ground petiolate photosynthetic leaves, and they present their small flowers on relatively long scapes (Fleischmann 2012).

Genlisea are typically grown in a peat/sand soil mix heavy on the sand in pots tall enough to accommodate the traps. The water level is kept near the top of the pots. Grown this way, you cannot just turn the pot upside down in one hand and ease off the pot with the other hand to see the traps like you can with many *Utricularia* species grown with less sand and under drier conditions.

Personally, I am only interested in growing *Genlisea* if I can grow them in a way where I can see the traps whenever I want to see them. When considering how I could grow them that way, I realized the cheese baskets that I get ricotta cheese in would make the ideal soil holder for the plants and I could use yogurt containers with the lids to suspend the baskets with the plants in water. Except for a few feet of black plumbers PVC pipe wrap tape, all the materials needed to make the *Genlisea* growing containers are items that would have been either recycled or sent to a landfill.

Figure 1: *Genlisea hispidula* traps.

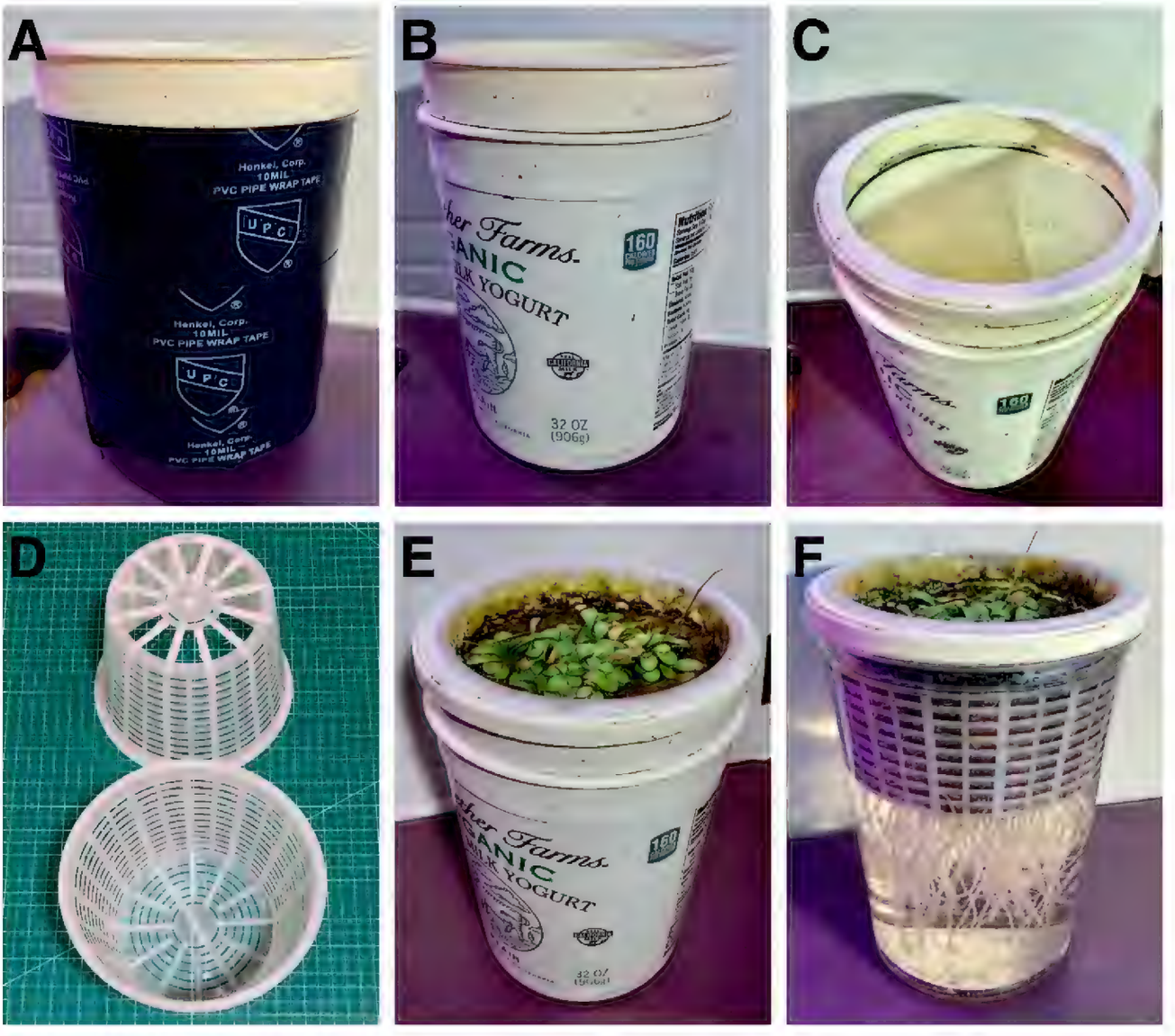

Figure 2: Construction of a *Genlisea* growing container. **A**. a 32 oz. yogurt container is taped to exclude light. **B**. the taped container is put inside another container for strength and stability. **C**. a lid is cut to fit a cheese basket. **D**. the cheese basket may need to be modified to allow the traps to escape the basket easily. **E**. these *Genlisea hispidula* plants are planted in pure long fibered *Sphagnum* moss. **F**. to display the traps, the basket with the plants is put into a 32 oz. deli container with fresh water.

The key item to find is a ricotta cheese basket that fits a 32 oz. yogurt container or some other container you have (Fig. 2D). Cheese baskets come in a bewildering number of shapes and sizes. If you are lucky, your grocery store carries a brand of ricotta or similar cheese that comes in a basket with a wide rim and you like ricotta. There are other options, of course, where you may have to buy or build something or otherwise be creative. An excellent option is small net pots (Fig. 3). Net pots also come in a number of sizes with various features. There are 3-inch net pots (82 mm wide at the top by 65 mm deep) that are the perfect depth for most if not all *Genlisea*. It is important to get net pots with wide rims so they will hang properly.

The biggest problem growing *Genlisea* so wet, especially if you use fertilizer, is the presence of cyanobacteria. It would be nice if you could grow *Genlisea* all the time in a display as pictured in D'Amato (1998). Unfortunately, you need to settle for systems where you have one setup for growing and another for display. Using tape to exclude light from the yogurt or other container will keep the traps free of cyanobacteria and algae. I use PVC pipe wrap tape because it is black, somewhat

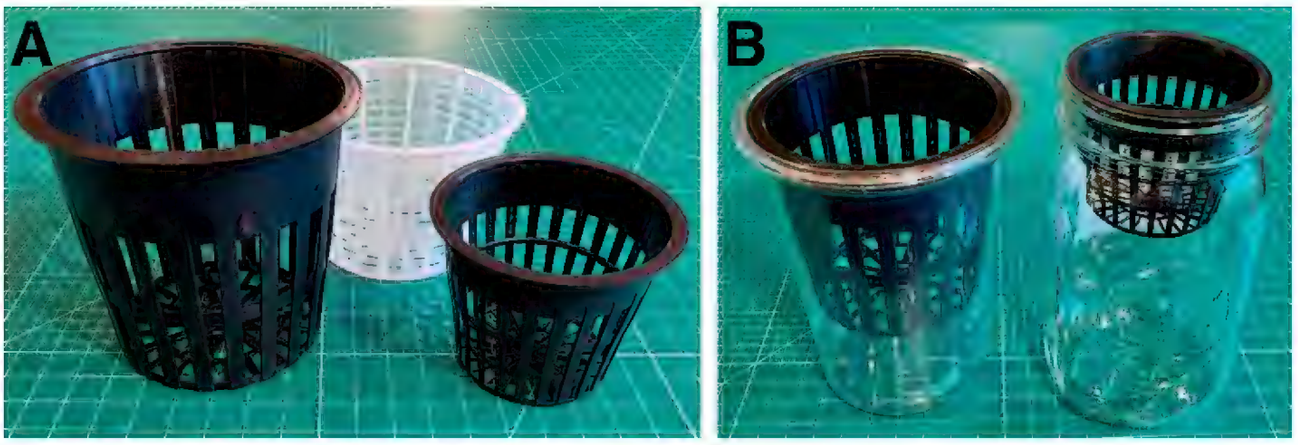

Figure 3: Net pots are an alternative to cheese baskets. **A**. Notice the wide rims on the top of these pots. The "4 inch" pot on the left is actually $4^1/_4$ inches (108 mm) edge to edge at the top; the "3 inch" pot is $3^1/_4$ inches (82 mm) edge to edge. **B**. The 4-inch pot fits in a 32 oz deli container after cutting a 4-inch hole in the lid; the 3-inch pot fits nicely in a wide mouth canning jar. Unfortunately, the 4-inch net pot is too deep to see *Genlisea* traps well but could be interesting for larger *Utricularia*. For *Genlisea*, this 3-inch net pot is perfect in a quart wide mouth canning jar.

stretchy, waterproof, and something I always have on hand (Fig. 2A). Any tape that excludes light will work. Since I allow the tape to extend onto the bottom, the taped container needs to be inside another container to be stable (Fig. 2B). The extra container also makes the setup stiffer when handling. If you use a canning jar with a basket or net pot, a sleeve made from heavy black plastic could work well.

Unless a cheese basket or net pot exactly fit the container, the lid will need to be cut to hold the basket. The baskets I get with ricotta are made by an Italian company (Anelli srl, P00665) although the dairy that makes the cheese is in California. The baskets need a hole about 98 mm wide. It turns out the yogurt lids have a ridge at about that width, so it is easy to cut a hole to hold the basket (Fig. 2C). The baskets should have some of the slats removed in the bottom to allow the traps to grow unimpeded. Use a utility knife with just a minimal amount of a new blade exposed from the outside of the basket or a chisel and block of wood from the inside. With the utility knife it is very easy to lose control of the knife and damage the basket if you use too much of the blade (Fig. 2D).

Long fibered *Sphagnum* moss is an excellent substrate for growing *Genlisea*. A new culture can be started by separating mature plants if the species self-propagates or, more commonly, from leaf cuttings using the photosynthetic or

Figure 4: *Utricularia reniformis* growing in a 3-inch net pot in a plastic glass. Notice there is no rim so this brand of net pot will not work suspended in a wide mouth canning jar. Photo by Mark Anderson.

the trapping leaves. The plants in Figure 2E have been growing in that basket over two years. You can also grow *Utricularia* species this way although there are a limited number of *Utricularia* species with underground traps that like being fully immersed in water like most *Genlisea*. With typical terrestrial *Utricularia* you would not necessarily need tall containers. If the plants want the water level lower, you could use short containers (Fig. 4). If you keep the water level well below the surface in a dark container, it is hard to determine at a glance when to add water. For species that really want a peat/sand soil mix, the basket or pot may be lined with long fibered *Sphagnum*.

Figure 5: *Genlisea hispidula* flower.

Maintaining the water level can be an issue for plants grown indoors where you cannot regularly hose off the plants. I cover mine with a plastic bag to help minimize evaporation and I forget about them for weeks if not months at a time. The plastic bag does interfere with flowering (Fig. 5) so for flowers it may be better to grow them in a large aquarium or just on a shelf in a plant tray. When I want to show off the traps, I put the basket in a 32 oz. deli container with clean water (Fig. 2F). You may need to cut a hole in the original deli container lid.

Genlisea do not require but appreciate strong light. Intense light will encourage cyanobacteria to overgrow the plants if you put too much fertilizer in the water. I have found that putting 5 to 10 coarse grains of a dry chemical fertilizer in the water does wonders for the plants. Once I put a pinch of fertilizer in the water for one plant. That was too much. The plants became completely overgrown with cyanobacteria. It required cleaning off the plants, flushing the soil and changing the water. They survived the episode just fine. Now I tend to fertilize the plants only when I change the water and want them to grow. That may only be once a year if the plants are looking good.

With the water level at the top of the soil, moss and *Drosera* can grow with the *Genlisea*. Raising the water level so that the plants are totally submerged can eliminate the moss, but I found *Drosera spatulata* to grow better totally submerged for months than they did in the nearby pots with peat/sand sitting in a small amount of water. Maybe it was the fertilizer in the *Genlisea* water.

Genlisea is underappreciated and should be grown more in ways that show off their traps. I find this method easer and the plants do better for me than using the traditional method.

Acknowledgements: I thank Mark Anderson and Djoni Crawford for comments and suggestions on this article.

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Deli display case converted into a carnivorous plant highland chamber

James Falconio • Clearwater Carnivores & Exotic Plants • Clearwater • Florida • USA • clearwatercarnivores@gmail.com

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I would like to thank everyone who has converted a chest freezer into a highland chamber for *Nepenthes* and other carnivorous plants. Seeing all those videos of setups, conversions, monitoring systems, and H_2O/RH automation systems are what pushed me to find a different, more enjoyable visual solution to having a highland chamber. This setup is for the serious *Nepenthes* enthusiasts and collectors.

The main issue I had with chest freezer highland chambers is that you must stand right over the top to see your plants through a piece of glass that is most likely not clear or blocked by light fixtures, etc. So as the months went by, I kept finding myself standing in grocery stores staring at beverage coolers, big ones, small ones, and giant floral coolers, which are all expensive. Then I was at my friend's Italian deli and noticed this very cool desert deli display case, all glass except for the bottom. It was perfect! I was drooling with ideas racing through my head of how it would look full of plants. I took a picture of the case and sent it to my now business partner, Robert Slothower, and within weeks he found a used one for around $300 delivered. It was fully functional and all glass, including the top. So, we were off to the races with a new project.

Now to plan the automation and monitoring systems. Sidenote, these types of coolers are not meant to be outside in the elements, however this one sits on my covered back porch out of direct sunlight.

Lighting: LED Full Spectrum. Sits on top outside of the chamber – directly on glass during winter and raised above the glass during long summer months. We are located in Southeast USA (Florida).

Temperature: We needed to override the factory temperature controller. The items needed to make this work are: Honeywell 4-stage Programmable Thermostat which allows gradual temperature changes and sits inside the chamber; transformer 110v – 24v; solenoid 110v – 24v; Cat5e/6e cable or any light gauge electrical wire.

Watering: Any misting system works, but we chose a 45-psi electric pump to push the closed loop water system.

Humidity: We use a digital humidifier with timer and detailed settings.

Monitoring: For temperature and relative humidity, we like the "SensorPush" portable monitors used with mobile app.

Education Corner

Kenny Coogan • ICPS Education Director • kenny@carnivorousplants.org

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2nd Annual World Carnivorous Plant Day – a huge success.

World Carnivorous Plant Day (WCPD) was first brought to the attention of the ICPS Board of Directors in 2020 by Krzysztof Banaś of Poland. Krzysztof envisioned a day that brought carnivorous plants into the spotlight of public awareness and education. ICPS wanted to host it in the Northern Hemisphere spring to take advantage of the plants coming out of dormancy. We wanted to select a weekday to encourage schools and children to participate. We also needed to avoid the first Saturday in May, as that is World Naked Gardening Day which could be a dangerous combination with carnivorous plants.

We thank everyone who created content for this annual celebration of carnivorous plants. Here is the playlist which can be viewed on the ICPS YouTube channel and Facebook:

https://www.youtube.com/c/CarnivorousplantsOrg1972/videos
https://www.facebook.com/InternationalCarnivorousPlantSociety/videos

1. Happy 2nd Annual World Carnivorous Plant Day from around the world
2. Growing carnivorous plants in Australia by Rob Gibson
3. *Heliamphora* phylogeny and evolution by Sukuan Liu
4. Carnivorous plants of the Grampians National Park, Australia by Boaz Ng
5. Carnivorous plant care in a tropical environment by Brynt Christian Realubit Rodriguez, owner of Pet Plants Philippines
6. Calcium-imaging of the Venus flytrap by Hiraku Suda
7. *Nepenthes* nomenclature and breeding by Geoff Mansell of Exotica Plants
8. Growing carnivorous plants in Shanghai, China by G.H.
9. Ingenious traps - by Siggi & Irmgard Hartmeyer, Stephen E. Williams, Jan Schlauer, Simon Poppinga
10. Carnivorous plant taxonomy and why we should care by Aurélien Bour botanist & scientific curator at Nantes Botanical Garden
11. Captivated: The allure of carnivorous plants (2021) by Jonathan S. Kui
12. Creating carnívoras de Costa Rica by Marco Acuña
13. Unraveling the mystery of *Drosera afra*, and two new species of *Drosera* from South Africa by Alex Dietrick
14. *Drosera capensis* in the wild by Hendré Barnard
15. A comprehensive guide to *Cephalotus* by Anthony Cangemi
16. Lowland *Nepenthes* greenhouse tour and propagation by Manny Herrera
17. Lee's Botanical Gardens, reminiscing about a life with carnivorous plants by Bruce Bednar
18. Minnesota's carnivorous plants and conservation by David Remucal
19. Can *Byblis* be germinated solely by water? By John Ende
20. *Sarracenia* garden with cultivation tips by David Fefferman

21. Why everyone should grow carnivorous plants from seed by Damon Collingsworth
22. Using pitcher plants as model systems for ecological and environmental research and learning by Aaron Ellison
23. Growing *Heliamphora* by Rupert Cornelius
24. *Darlingtonia* in Butterfly Valley by Kate Halpin
25. Australian carnivorous plant diversity by Greg Bourke
26. ICPS Annual Photo Contest

On World Carnivorous Plant Day, I posted the videos hourly. Last year and this year we had ten countries contribute to the main 24 videos which feature cultivation and conservation content. Participating countries included: Australia, China, Costa Rica, England, France, Germany, Japan, Poland, South Africa, and United States. All contributions were greatly welcomed.

One submission that stood out was Jonathan S. Kui's full length documentary, titled, "Captivated: The Allure of Carnivorous Plants (2021)", which follows the lives of four carnivorous plant growers over the course of one year. Another was Boaz Ng's "Carnivorous plants of the Grampians National Park, Australia". Ng's cinematography is on par with a David Attenborough-esque film. It makes me want to go out and explore wild carnivorous plants.

I received the most private messages saying Hiraku Suda's submission of "Calcium-imaging of the Venus flytrap" was astonishing. Sigi Hartmeyer said "Science at its best, visualizing the memory of the VFT. Congrats to all participants for this successful project."

Aside from ICPS's introduction compilation video, the most views of the 2022 set was for "Carnivorous plant care in a tropical environment" by Brynt Christian Realubit Rodriguez, owner of Pet Plants Philippines, which is in Filipino and dubbed in English.

If you want to participate next year, please contact kenny@carnivorousplants.org.

WCPD ended with our annual photo contest which was open to any ICPS member or anyone who follows our social media pages. Participants from twenty-one countries entered the contest.

Screen grab from the WCPD video "*Darlingtonia* in Butterfly Valley with Kate Halpin".

People and Plants: Boaz Ng, *Utricularia dichotoma* x *oppositiflora*.

Plants in the Wild: Zachary Lim, *Pinguicula primuliflora* growing on a stump within a creek in central Georgia, USA.

Thank you, Stéphane Joly, Krzysztof Banaś, and Phillip Bernie for being the judges this year. We are excited to announce that the winners of this year's contest will serve as the judges for next year's photo contest.

Start photographing your plants now to enter in next year's photo contest. Each winner receives a 1-year membership to ICPS.

Plant Portrait: Nicolas Bogaert, A regular Venus flytrap in my own collection, in my peatbog.

From Richard Nunn, President ICPS

The ICPS is very pleased with the momentum building around WCPD. In this, only our second year, we have seen an increase in the content and participation, and we are very happy with the number of countries with representation. WCPD is a key platform for helping the ICPS become a more international society, we are very aware that there are many members of the global CP community outside of our traditional English-speaking markets and this vehicle in an important way to connect with them. In a divided world, it was very heartening to see the joy and community spirit evident in the opening welcome video montage.

Over time we expect the event to increase in popularity as more people become aware and the quality of our video content is recognized as it is disseminated through open access platforms.

New content for 2022

With a lot of information available about cultivation and conservation of carnivorous plants, one of the aims as Education Director for ICPS is to provide a premium education service to our members. In 2022, we added monthly webinars. To view the topic, speaker, and link for the monthly virtual webinars, sign into https://icps.clubexpress.com/. ICPS members can attend these sessions live to interact and ask questions of the experts. If you are unable to attend, the recording of the webinars can be viewed by members and non-members on the ICPS Facebook page and YouTube page about a week after the live event. If you have a suggestion for a topic or presenter, contact kenny@carnivorousplants.org.

In addition, we are holding monthly happy hours to serve as a digital pub where ICPS members can discuss problems and come up with solutions for growing of carnivorous plants. Recently, with so much great information shared, including field sightings, our happy hours have been turning into happy two-hours.

I am also creating content for those wanting to start to grow carnivorous plants or learn about their workings. As part of this initiative, I wrote five animated videos prior to World Carnivorous Plant Day. The topics cover:

What are Carnivorous Plants?

How to Grow Carnivorous Plants Indoors

How to Grow Carnivorous Plants Outdoors
How to Acclimate Carnivorous Plants to Your Home
How to Feed Indoor Venus flytraps

John Brittnacher and Richard Nunn edited the scripts. I then submitted them to an animation studio in Canada providing notes for a storyboard. Once the storyboard was approved, animators spent a few weeks on each of the five videos. After several edits and about 6 months, the videos were released on the ICPS YouTube and Facebook channels the week prior to WCPD. We hope you enjoy them and share them with your friends!

By the end of this year, I would like to create more materials that can be used in the classroom. In August, we will be holding our second annual Carnivores in the Classroom Grant for teachers in public and private schools around the world to add carnivorous plants in their teaching space to get kids excited about botany and these well adapted plants.

All education initiatives are funded by generous donations through https://www.carnivorousplants.org/donate or by purchasing World Carnivorous Plant Day or ICPS merchandise at https://world-carnivorous-plant-day.creator-spring.com/ All links are available through our website: carnivorousplants.org.

An interview with Margaret Cho

Kenny Coogan • ICPS Education Director • kenny@carnivorousplants.org

https://doi.org/10.55360/cpn513.kc640

Margaret Cho – is familiar with the International Carnivorous Plant Society! She is a Grammy and Emmy Award nominated stand-up comedian, actress, and singer-songwriter, who started her carnivorous plant journey in February 2022. I had a Zoom conversation to learn more.

"The book *Savage Garden* is really incredible, it's a classic and has helped me get a lot of confidence," Cho told me.

While she doesn't grow anything inside her California home, due to her hungry hairless cats, she is excelling in her outside bog. The bog consists of several cultivars of Venus flytraps including B52, *Drosera capensis*, and several *Sarracenia*. She tried *Nepenthes* but mistakenly put them in the bog and full sun.

"All of the stuff in the bogs are so maintenance free. You don't do anything," Cho told me. "They are the most carefree plants because they are always sitting in the distilled water. And I just top off the water by an inch or so and there is nothing to it. It's really incredible."

Although she just started, one of her wish list items to add to her collection is a Cobra lily (*Darlingtonia californica*). She would also love to go to Southeast Asia, specifically Borneo, and see some of the larger pitcher plants on a hike.

I asked her what her impetus was in starting to grow carnivorous plants.

"I think they are so beautiful. I remember being a little kid and seeing them on television and seeing people feeding pieces of hamburger to Venus flytraps. Or I would see the plants in death cubes at variety stores and they are so beautiful."

Doing some image searches online and seeing the vast number of cultivars this past winter pushed her to start growing her own.

"I don't need to hand feed them. Every time I go out there the B52s always have exoskeletons, so I don't have to do anything. I have 28 bird feeders, so the birds just pick off the exoskeletons. The *Drosera capensis* really likes to eat. She always has something wiggling in that dew. It is pretty incredible. She has a big appetite. I can't really see what's inside the *Sarracenia*, but I am sure they are eating since they are growing really well."

While the comedian is covered in tattoos, she currently doesn't have any of carnivorous plants.

"Although it is a good idea! I love the monkey cups and the Venus flytraps are so beautiful – they look like big eyes."

New cultivars

Keywords: cultivar, *Darlingtonia californica* 'Iago', *Dionaea muscipula* 'EGAC Smurf', *Dionaea* 'PFT Carcharoth', *Nepenthes ampullaria* 'Black Rainbow', *Pinguicula zecheri* 'Faulisi', *Sarracenia* 'Templar Cross', *Sarracenia flava* var. *rubricorpora* 'Valkyrie'.
https://doi.org/10.55360/cpn513.cv513

Abstract: Seven new carnivorous plant cultivars are named and described: *Darlingtonia californica* 'Iago', *Dionaea muscipula* 'EGAC Smurf', *Dionaea* 'PFT Carcharoth', *Nepenthes ampullaria* 'Black Rainbow', *Pinguicula zecheri* 'Faulisi', *Sarracenia* 'Templar Cross', *Sarracenia flava* var. *rubricorpora* 'Valkyrie'.

Nepenthes ampullaria 'Black Rainbow'

Submitted: 9 March 2022

Nepenthes ampullaria is a lowland *Nepenthes* species that can be found in Borneo, New Guinea, Sumatra, the Maluku Islands, and the Malay Peninsula, which includes Thailand and Singapore. Despite having extremely little morphological variations, *N. ampullaria* has an incredible variation of pitcher coloring. *Nepenthes ampullaria* 'Black Rainbow' is the result of color breeding between a *N. ampullaria* from Krabi Carnivores Nursery (female plant) and a *N. ampullaria* × *N.* 'Black Miracle' hybrid from Thammarat Garden (male plant) to generate new color characteristics.

The lower pitcher of *Nepenthes ampullaria* 'Black Rainbow' is a tricolor urceolate with a bright green peristome that turns green-brown as it ages (Fig. 1). The largest proportion of color content is black, followed by red and green, respectively. The wings are dark black, and the tendril is short and covered with brown hair. The leaves are green with black speckles at the tips, but the shape of its leaves and stems are not different from typical *N. ampullaria*. The cultivar's distinguishing characteristics are the spectacular color combinations of the pitchers.

—Sunya Nuanlaong • Krabi Carnivores • Nepenthes & Exotic Plants Nursery • Ao Luek Tai • Ao Luek • Krabi 81110 • Thailand • sunya.ton@gmail.com

Figure 1: *Nepenthes ampullaria* 'Black Rainbow' lower pitcher and color pattern of lower pitcher

Submitted: 24 April 2022

Darlingtonia californica 'Iago' (Fig. 2) is a seed-grown plant grown and selected from a large batch of seed. In the summer of 2018, I had the pleasure of visiting a bog in Plumas County, California, where a healthy population of *D. californica* were living. Seed were collected from several reddish plants growing on private land with explicit verbal permission from the owner. The seeds were not collected from Butterfly Valley or any other protected area where seed collection is illegal. After the seeds were germinated in fall 2018, only the cherry red seedlings were kept, and the culling continued until the only seedling left had the color closest to a vibrant cherry red. When the specimen was about two years old, it divided several times, and the divisions were given to friends and traded away.

Figure 2: *Darlingtonia californica* 'Iago'.

Darlingtonia californica 'Iago' tends to grow slower for me in cultivation and is more sensitive to high temperatures than my other cobra lily specimens. While for me, typical *D. californica* specimens grow and mature in 2-3 years, *Darlingtonia californica* 'Iago' has not yet matured after 4 years of cultivation, though it has sent out stolons and created many divisions. Additionally, it tends to prefer very bright sun. *Darlingtonia californica* 'Iago' tends to have a shorter growth habit than other specimens of *D. californica* in my care. The specimens of *D. californica* 'Iago' seem to prefer a 1:1 mix of sphagnum moss to perlite and enjoy white containers which reflect sunlight and keep their root system cool. As with all *D. californica*, on hot days, the plants must be watered with cool water, and must receive a temperature drop at nighttime in order to thrive. Although the red color of the cultivar seems to stay with age (4 years old currently) there may be a chance that the plants may revert to greenish adult pitchers if the plant is kept in lower-light conditions or it is stressed, however I am pretty confident that the red coloration of the cultivar will persist in adult plants.

In the Shakespearean drama Othello, Iago is full of rage because he believes he was denied from a job he should have rightfully had. Because rage is synonymous with the color red, and because the cultivar is a bright red, Iago seemed to be a fitting name. The epithet was also chosen to coordinate with the name of the other cultivar of *D. californica*, 'Othello'. To me, the names work together perfectly, as 'Iago' anthocyanin-rich and 'Othello' is anthocyanin-free. This drastic difference is mirrored by the two characters' contrasting personalities in Shakespeare's play.

To preserve the deep red color, this plant should be reproduced only by asexual means, such as by stolons or divisions. Additionally, the tissue cultured callus seems to be very stable, so future propagation by tissue culture may be useful.

—Milan Del Buono • Palo Alto • California • USA • milan.del.buono@gmail.com

Pinguicula zecheri 'Faulisi'

Submitted: 20 April 2022

In July of 2017, while touring down the U.S. Pacific coast with Carson Trexler, I had the pleasure to meet Phil Faulisi on a visit to his home. As you might expect, we left with a great many wonderful *Sarracenia*. But I also left with this absolutely staggering Mexican butterwort.

Phil had two small plants sharing a pot under lights beneath a workbench in his garage. When I asked about them, he offered to let me take them home with me since his attention was on *Sarracenia*. If they grew for me, he said, I'd be rewarded with one of the most spectacular flowers of any *Pinguicula*. It took me about six months to get a flower and he wasn't lying!

If memory serves, Phil told me that it was originally collected by Alfred Lau and made its way to him indirectly by one or two degrees. The location where it was collected by Lau is unknown. If anyone finds it, please tell me! It is absolutely a life goal of mine to visit where these grow *in situ*. I sent photos to Fernando Rivadavia who said, "Wow, that's a BEAUTY!! It sure looks like a *P. zecheri* on the larger end of the spectrum," so I'm including *P. zecheri* in the full registration name but casually refer to it in conversation and below as *Pinguicula* 'Faulisi.'

Pinguicula 'Faulisi' has enormous flowers, over 52 mm tall and 48 mm wide, held aloft on sturdy stalks that can be around 15+ cm long (Fig. 3). The large, vibrantly pink lobes have wonderful ruffles. The throat is white with fine white hairs; the stigma is pink. The gradually tapering spur is usually around 50+ mm long. Both the spur and stalk are covered with fine white hairs but few if any produce mucilage. *Pinguicula* 'Faulisi' loves to give lots of thick, yellow pollen and father plants, but has been a bit picky with whom it'll produce viable seeds with. I've heard speculation and wondered myself if this is the largest *Pinguicula* flower but it has not been officially confirmed.

The leaves are also notable. The large, round carnivorous leaves have upturned margins with purplish coloration around the edges and wonderfully contrasting lime centers. The non-carnivorous winter leaves are similar but smaller and more succulent-like; I don't believe I've ever seen them truly lose their carnivorous glands in this state, but *Pinguicula* 'Faulisi' also tends to like being grown wetter than most Latin American *Pinguicula* so it's not surprising that it doesn't go fully dormant. Both leaf formations have distinct purplish petiole bases, as well. The plant itself can grow to upwards of 10+ cm across.

Pinguicula 'Faulisi' can be a slow grower but is absolutely worth the wait. It likes a more organic mix: I'm currently growing most of mine in LFS/perlite and many have a top dressing of live sphagnum. Jeremiah Harris has grown his beautifully in just a peat/perlite mix.

I've been calling the plant "Philcula" from a placeholder name Phil had for it, but I thought naming it after Phil properly would be the best "thank you." For anyone that may already have this plant in their collections, please update your tags to *Pinguicula zecheri* 'Faulisi'.

—Howard Bramble • Colorado Springs • Colorado • USA • howardbramble@gmail.com

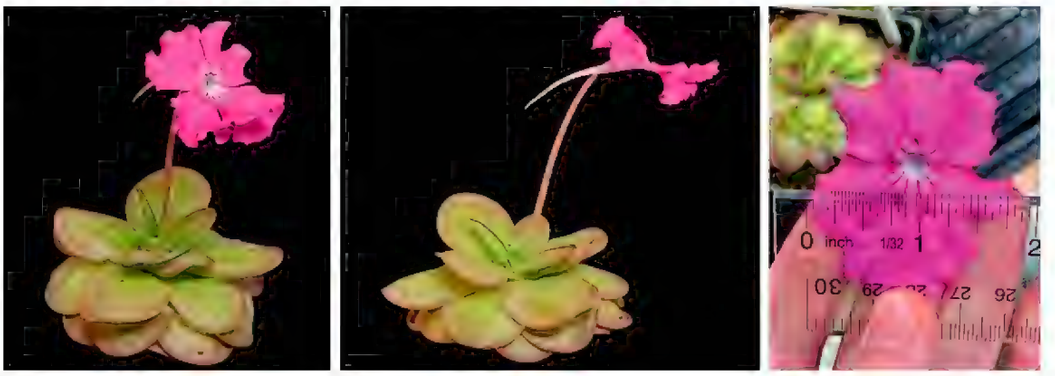

Figure 3: *Pinguicula zecheri* 'Faulisi'.

Sarracenia 'Templar Cross'

Submitted: 22 March 2022

Sarracenia 'Templar Cross' (Fig. 4) is a selected seedling that was given to me in 2016 by Paolo Calzimitto when it was very young, but it showed its peculiarities only when it arrived in adulthood. It is a complex hybrid of (*S. leucophylla* Ll4 Phil Wilson × *S. leucophylla* L04 Mike King) × (*S.* × *moorei* H211 Mike King)

Sarracenia 'Templar Cross' differs from other white *S.* × *moorei* (e.g., *Sarracenia* 'Silvia Luise'), most of all, for the top of the lid, which is particularly accentuated towards the top, forming a "V" shape between the peristome and the operculum, giving the mouth its characteristic rhomboid shape, with an impressive mouth opening that reaches a diameter of about 10 cm. Furthermore, the throat spot pigment is pale fuchsia (instead of a dark spot as in *Sarracenia* 'Legacy'). It is pure white that starts from the lid and stops in the middle of the pitcher body, and in late autumn the fenestrations almost disappear, which makes it look like a *S. leucophylla* var. *alba*. In this beautiful *Sarracenia*, the pitcher grows thick and vigorous, and, moreover, there is no sign of pubescence in any part of the ascidium (as in *Sarracenia* 'Iamsatiricon').

It is a very elegant and robust *Sarracenia*, giving its best in the autumn months reaching a height of about 90 cm.

All these characteristics make *Sarracenia* 'Templar Cross' a marvellous unique plant.

The plant owes its name to the particular fuchsia spot inside its throat in contrast with the candid white color of the lid, which recalls the typical banner of the Templar Knights.

To maintain and preserve the unique features of this specimen, propagation must be only by division of the rhizome.

—Pietro Falchi • Iglesias • Sardinia • Italy • joey_pietro_80@hotmail.it

Figure 4: *Sarracenia* 'Templar Cross'.

Sarracenia flava var. *rubricorpora* 'Valkyrie'

Submitted: 21 June 2022

Sarracenia flava var. *rubricorpora* 'Valkyrie' (Fig. 5) was originally grown from wild seed from the Sumatra area of the Apalachicola National Forest in Liberty County, Florida. Some years ago, a semi-adult plant caught my eye at Matt Soper's carnivorous plant nursery in the United Kingdom because it showed a lot of potential due to its extraordinary good contrast between the almost black veins and a bright yellow lid. The level of excitement could not be bigger when I found out this seed-grown plant was available. In the following years, this plant started to show its true qualities in my backyard greenhouse in the Netherlands. It quickly became my favorite clone of this species that I was growing at this time. At the beginning of the season when the best pitchers are formed it looks mostly like a very heavy veined form of *S. flava* var. *ornata*, but as the pitchers open and when the plant is well settled, all of the veining on the tube quickly infuses and turns into one of the darkest burgundy colors I have ever seen on any *S. flava*. This change in color happens during the exact same period when the classic sulphur-colored flowers are open. Also worth mentioning are the raised blue veins that appear on the tube of the pitcher. The big lid of the pitcher is bright yellow on top with nearly black veins which do not bleed out into the yellow sections of the lid. This desirable trait is maintained until the pitchers die back at the end of the summer. The strong contrast between the bright colored lid and the dark pitcher tube makes this plant worth cultivating in my opinion.

I would like to commemorate this exceptional plant to my father, who passed away in June 2003, by naming it after his favorite classical song "Ride of the Valkyries", which was often played in the house around the time when I was just growing my very first carnivorous plants during my youth.

Sarracenia flava var. *rubricorpora* 'Valkyrie' must only be propagated vegetatively to maintain the extraordinary qualities of this cultivar.

—Laurens Eggen • Peaty Pitchers • Venlo • The Netherlands • info@peatypitchers.com

Figure 5: *Sarracenia flava* var. *rubricorpora* 'Valkyrie'.

Dionaea 'PFT Carcharoth'

Submitted: 31 March 2022

Dionaea 'PFT Carcharoth' is a first-generation (F1) self-pollinated offspring of *Dionaea* 'Werewolf' selected in September 2020, and has proven to be quite vigorous in the PetFlyTrap.com greenhouse. It is named for the werewolf character of the same name from the early Tolkien timeline history ("The Silmarillion" *et al.*) leading up to "Lord of the Rings". In Tolkien mythology, Carcharoth was the offspring of the first werewolf (Draugluin), and was fed human (and elvish) flesh. He was the greatest and most powerful werewolf to ever live. I chose this cultivar name because this cultivar is a first-generation offspring of the original *Dionaea* 'Werewolf' cultivar, and as with all carnivorous plants, it eats "flesh". We have also found it to be much more vigorous than the parent *Dionaea* 'Werewolf' plant, which has been described as difficult to maintain at a mature size; *Dionaea* 'PFT Carcharoth' is definitely "greater and more powerful" than its predecessor.

Dionaea 'PFT Carcharoth' (Fig. 6) can be distinguished from its parent by the broad, claw-like marginal spines on adult specimens that are more uniform in direction, as opposed to the more directionally-challenged growth of marginal spines on *Dionaea* 'Werewolf'. The marginal spines on *Dionaea* 'PFT Carcharoth' also point straight up or even curve outward (Fig. 6), whereas we have found the spines of *Dionaea* 'Werewolf' tend to curve slightly inward. As with the parent cultivar, *Dionaea* 'PFT Carcharoth' is devoid of trigger spines.

Dionaea 'PFT Carcharoth' must be propagated vegetatively (though divisions or cloning) to maintain the characteristics listed here.

—Mike Howlett • PetFlyTrap.com • 3826 E. Mossy Oaks Rd. • Spring • Texas 77389 • USA • orders@petflytrap.com

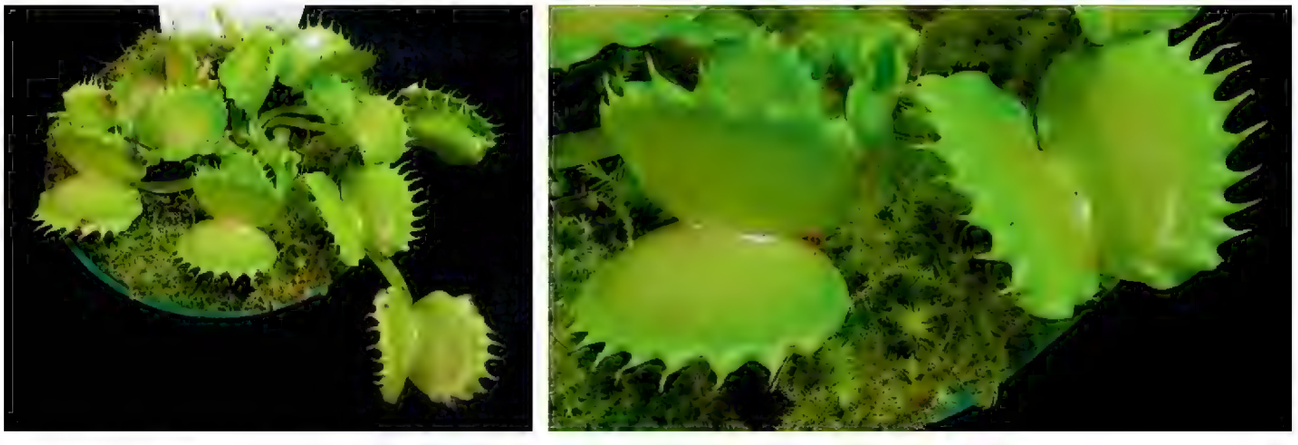

Figure 6: *Dionaea* 'PFT Carcharoth'.

Dionaea muscipula 'EGAC Smurf'

Submitted: 24 March 2022

Dionaea muscipula 'EGAC Smurf' (Fig. 7) is the result of pollination from the anthers of *Dionaea* 'Cross Teeth' to the stigma of *Dionaea* 'Triton' on 21 December 2018. A total of 18 seeds germinated. During the following months, three seedlings exhibited traits that were different from the rest of the seedlings, specifically a cup-shaped trap with cilia of random sizes and especially they were much smaller.

The leaves of *Dionaea* 'EGAC Smurf' grow horizontally and close to the ground throughout the growing season. After the growth period, they begin to replicate themselves by separation of the rhizome and quickly form multiple plants. A mature plant has never had a diameter exceeding 1.5 cm during all stages of growth to maturity. This cultivar maintains an approximate ratio of 2:1 between the base of the leaf and the length of the trap, the mature traps do not exceed 3 mm in length, while the base of the leaf maintains a thin shape. The name Smurf refers to the plant's tiny size and ability to make numerous divisions; EGAC are the initials for my greenhouse Euro Gardens and my name Andrés Caldas.

Dionaea 'EGAC Smurf' exhibits a reddish/yellow hue within the entire trap including the cilia when grown in 6 hours of direct sunlight, accompanied by a light green coloration at the base of the leaves. Traps exhibit a fusion or aleatory crossing in the cilia. When the traps are first formed, they are totally green and due to their tiny size, the cilia are practically transparent.

Dionaea 'EGAC Smurf' differs from several somewhat similar registered *Dionaea* cultivars.

- *Dionaea* 'Cross Teeth': *Dionaea* 'EGAC Smurf' plant is up to five times smaller. The trap shape is different in that it is cup-shaped but has retained the crossed cilia.
- *Dionaea* 'Cudo': *Dionaea* 'EGAC Smurf' plant is up to three times smaller. The trap is is cup-shaped, not crescent-shaped.
- *Dionaea* 'Cupped Trap' and *Dionaea* 'Kinchyaku': *Dionaea* 'EGAC Smurf' is much smaller, never exceeding 1.5 cm in fully mature plants. A complete plant is smaller than the single trap of the *D.* 'Cupped Trap' or *D.* 'Kinchyaku'. The trap shape is similar, except for the size, but the base of the leaf has very thin leaves.
- *Dionaea* 'Petite Dragon': Although the *Dionaea* 'Petite Dragon' is a very small cultivar, *Dionaea* 'EGAC Smurf' is more than three times smaller and has cup-shaped traps. *Dionaea*

Figure 7: *Dionaea muscipula* 'EGAC Smurf'.

'EGAC Smurf' retains a traditional green/reddish color, while the *Dionaea* 'Petite Dragon' clearly has a purple color.

- *Dionaea* 'Triton': *Dionaea* 'EGAC Smurf' plants are up to seven times smaller. The shape of the traps is similar, but their size is much smaller. The color has a mixture of green at the base of the leaves and yellow/reddish in the traps, while *Dionaea* 'Triton' is mostly green.

To maintain this cultivar's unique characteristics, reproduction must be only by vegetative methods, such as by rhizome division and leaf pullings.

—Andrés Rodrigo Caldas Enriquez • Quito • Pichincha • Ecuador • euro.gardens.ec@gmail.com

Names of carnivorous plant cultivars registered in 2021

Jan Schlauer • jan@carnivorousplants.org

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Name	Publication	Date of Registration
Cephalotus 'Kai's Error' A.Fisch	Carniv.Pl.Newslett.50:36 (2021)	14 May
Cephalotus 'Squat' D.Daskalov	Carniv.Pl.Newslett.50:87 (2021)	31 Jul
Dionaea 'CCCP Destruction' C.Heath	Carniv.Pl.Newslett.50:35 (2021)	14 May
Dionaea 'CCCP Red Onyx' C.Heath	Carniv.Pl.Newslett.49:191 (2020)	3 Apr
Dionaea 'Cthugha' T.Vayssade	Carniv.Pl.Newslett.49:190 (2020)	3 Apr
Dionaea 'Doomsday' T.Vayssade	Carniv.Pl.Newslett.49:187 (2020)	3 Apr
Dionaea 'EEC Purple People Eater' E.Wang & C.Heath	Carniv.Pl.Newslett.50:88 (2021)	31 Jul
Dionaea 'Envy' T.Vayssade	Carniv.Pl.Newslett.49:188 (2020)	3 Apr
Dionaea 'Lust' T.Vayssade	Carniv.Pl.Newslett.49:189 (2020)	3 Apr
Dionaea 'Magikarp' Y.Yang	Carniv.Pl.Newslett.50:89 (2021)	31 Jul
Drosera 'Avaricious Arugula' M.Del Buono	Carniv.Pl.Newslett.50:90 (2021)	31 Jul
Genlisea 'Odin' F.Anderson	Carniv.Pl.Newslett.50:37 (2021)	14 May
Nepenthes 'Khi Seechumpu' S.C.Sciutto	Carniv.Pl.Newslett.50:154 (2021)	30 Dec
Nepenthes 'Pennywise' C.Trexler	Carniv.Pl.Newslett.50:41 (2021)	14 May
Nepenthes 'Red Velvet Aurea' P.Oprasertsawat	Carniv.Pl.Newslett.50:153 (2021)	30 Dec
Nepenthes 'Simon' Z.Srostlik	Carniv.Pl.Newslett.50:42 (2021)	14 May
Sarracenia 'Bled Velvet' G.Bourke	Carniv.Pl.Newslett.50:157 (2021)	30 Dec
Sarracenia 'Caitrin Claire' C.Hall	Carniv.Pl.Newslett.50:38 (2021)	14 May
Sarracenia 'Dr M.' J.Addington	Carniv.Pl.Newslett.50:39 (2021)	14 May
Sarracenia 'Pink Eye' G.Bourke	Carniv.Pl.Newslett.50:158 (2021)	30 Dec
Sarracenia 'Red Closed Trap' M.Chinaglia	Carniv.Pl.Newslett.50:40 (2021)	14 May
Sarracenia 'Richard's Red' S.Morley	Pl.Carniv.41(1):7 (2020)	1 Jan
Sarracenia 'Talisman' O.Bres	Carniv.Pl.Newslett.50:91 (2021)	31 Jul
Utricularia 'Devil Spawn' G.Bourke	Carniv.Pl.Newslett.50:155 (2021)	30 Dec
Utricularia 'King Ghidorah' G.Bourke	Carniv.Pl.Newslett.50:156 (2021)	30 Dec

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- On-site pickups by appointment only

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